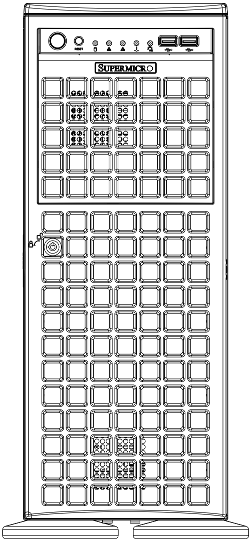
SUPER●®

SC747 CHASSIS
Series


RESET
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SC747TQ-R1400B

USER'S MANUAL

1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SC747 4U chassis. Installation and maintenance should be performed by experienced technicians only.

Supermicro's SC747TQ-R1400 server/workstation chassis is truly industry's most powerful high performance server chassis that offers 11 full-height, full-length PCI-E expansion slots and four sets of 6-pin and 8-pin power connectors to support up to four double-width GPU cards. Optimized redundant high-efficiency (93%) Gold Level 1400W power supplies with PMBus support and optimized thermal solutions with four hot-swap cooling fans plus two hot-swappable exhaust fans incorporating advanced fan speed controls, to accommodate the most demanding GPU applications. Its eight hot-swappable SAS/SATA HDDs offer exceptional storage capacity, and its three 5.25" storage modules can be rotated 90° to flexibly accommodate tower or rack-mountable configurations.

This document lists compatible parts available when this document was published. Always refer to the our Web site for updates on supported parts and configurations.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with this chassis and describes the main features of the SC747 chassis. This chapter also includes contact information.

Chapter 2: System Safety

This chapter lists warnings, precautions, and system safety. You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed before installing and servicing this chassis.

Chapter 3: Chassis Components

Refer here for details on this chassis model including the fans, bays, airflow shields, and other components.

Chapter 4: System Interface

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 5: Chassis Setup and Maintenance

Refer to this chapter for detailed information on this chassis. You should follow the procedures given in this chapter when installing, removing, or reconfiguring your chassis.

Chapter 6: Rack Installation

Refer to this chapter for detailed information on chassis rack installation. You should follow the procedures given in this chapter when installing, removing or reconfiguring your chassis into a rack environment.

Appendices

This section lists compatible cables, power supply specifications, and compatible backplanes. Not all compatible backplanes are listed. Refer to our Web site for the latest compatible backplane information.

Appendix A: Chassis Cables

Appendix B: Power Supply Specifications

Appendix C: SAS-747TQ Backplane Manual

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Notes

Chapter 1

Introduction

1-1 Overview

Supermicro's SC747 4U chassis features a unique and highly-optimized design. The chassis is equipped with high efficiency power supply. High performance fans provide ample optimized cooling for FB-DIMM memory modules and 8 hot-swap drive bays offer maximum storage capacity in a 4U form factor.

1-2 Shipping List

Please visit the following link for the latest shipping lists and part numbers for your particular chassis model http://www.supermicro.com/products/chassis/4U/?chs=747

SC747 Chassis				
Model	**CPU**	**HDD**	**I/O Slots**	**Power Supply**
SC747TQ-R1400(B)	DP/UP	8x SAS/ SATA	11x FF	1400W (Redundant)

1-3 Chassis Features

The SC747 4U high-performance chassis includes the following features:

CPU

The SC747 Chassis supports a DP/UP processor. Please refer to the motherboard specifications pages on our web site for updates on supported processors.

Hard Drives

The SC747 Chassis features eight slots for SAS/SATA drives. These drives are hot -swappable. Once set up correctly, these drives can be removed without powering down the server.

I/O Expansion slots

Each version of the SC747 Chassis includes eleven full I/O expansion slots.

Peripheral Drives

Each SC747 Chassis provides three 5.25” peripheral drive bays for floppy drives, DVD-ROM/CD-ROM Drives, or additional hard drives.

Other Features

Other onboard features are included to promote system health. These include four cooling fans, two exhaust fans, a convenient power switch, reset button, and five LED indicators.

1-4 Contacting Supermicro

Headquarters
Address: Super Micro Computer, Inc.
980 Rock Ave.
San Jose, CA 95131 U.S.A.
Tel: +1 (408) 503-8000
Fax: +1 (408) 503-8008
Email: marketing@supermicro.com (General Information)
support@supermicro.com (Technical Support)
Web Site: www.supermicro.com

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's-Hertogenbosch, The Netherlands
Tel: +31 (0) 73-6400390
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Address: Super Micro Computer, Inc.
4F, No. 232-1, Liancheng Rd.
Chung-Ho 235, Taipei County
Taiwan, R.O.C.
Tel: +886-(2) 8226-3990
Fax: +886-(2) 8226-3991
Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8226-1900

Notes

Chapter 2

System Safety

2-1 Overview

This chapter provides a quick setup checklist to get your chassis up and running. Following the steps in order given should enable you to have your chassis set up and operational within a minimal amount of time. This quick set up assumes that you are an experienced technician, familiar with common concepts and terminology.

2-2 Warnings and Precautions

You should inspect the box the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage, file a damage claim with carrier who delivered your system.

Decide on a suitable location for the rack unit that will hold that chassis. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated.

You will also need it placed near at least one grounded power outlet. When configured, the SC747 chassis includes a redundant power supply and require two grounded outlets.

2-3 Preparing for Setup

The SC747 chassis includes a set of rail assemblies, including mounting brackets and mounting screws you will need to install the systems into the rack. Please read this manual in its entirety before you begin the installation procedure.

2-4 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SC747 from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and the DVD-ROM and floppy drives (not necessary for hot swappable drives). When disconnecting power, you should first power down the system with the operating system and then unplug the power cords from all the power supply modules in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power, if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard battery: CAUTION - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM laser: CAUTION - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

2-5 General Safety Precautions

- Keep the area around the chassis clean and free of clutter.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

2-6 System Safety

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing any board from its antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

- Put the serverboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Chapter 3

Chassis Components

3-1 Overview

This chapter describes the most common components included with your chassis. Some components listed may not be included or compatible with your particular chassis model. For more information, see the installation instructions detailed later in this manual.

3-2 Components

Chassis

Chassis may include any one of the following three options:

- One fixed 3.5" hard drive.
- Up to four fixed 2.5" hard drives.
- One FH PCI add-on card

For the latest shipping lists, visit our Web site at: http://www.supermicro.com.

This chassis accepts four hot-swappable system cooling fans and two power supplies. SC747 models come in dark gray.

Backplane

Each SC747 chassis comes with a 4U backplane. Depending on your order, your backplane will accept SAS/SATA. For more information regarding compatible backplanes, view the appendices found at the end of this manual. In addition, visit our Web site for the latest information: http://www.supermicro.com.

Fans

The SC747 chassis accepts four system fans and two rear exhaust fans. System fans are powered from the serverboard. These fans are 4U high and are powered by 4-pin connectors.

Mounting Rails (optional)

The SC747 can be placed in a rack for secure storage and use. To setup your rack, follow the step-by-step instructions included in this manual.

Power Supply

Each SC747 chassis model includes a Gold level 1400W High-efficiency redundant (1+1) power supply (93%), rated at 1400 Watts. In the unlikely event your power supply fails, replacement is simple and can be done without tools.

3-3 Where to get Replacement Components

Though not frequently, you may need replacement parts for your system. To ensure the highest level of professional service and technical support, we strongly recommend purchasing exclusively from our Supermicro Authorized Distributors / System Integrators / Resellers. A list of Supermicro Authorized Distributors / System Integrators /Reseller can be found at: http://www.supermicro.com. Click the Where to Buy link.

Chapter 4

System Interface

4-1 Overview

There are several LEDs on the control panel as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. Most SC747 models are two buttons on the chassis a control panel: a reset button and an on/off switch. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

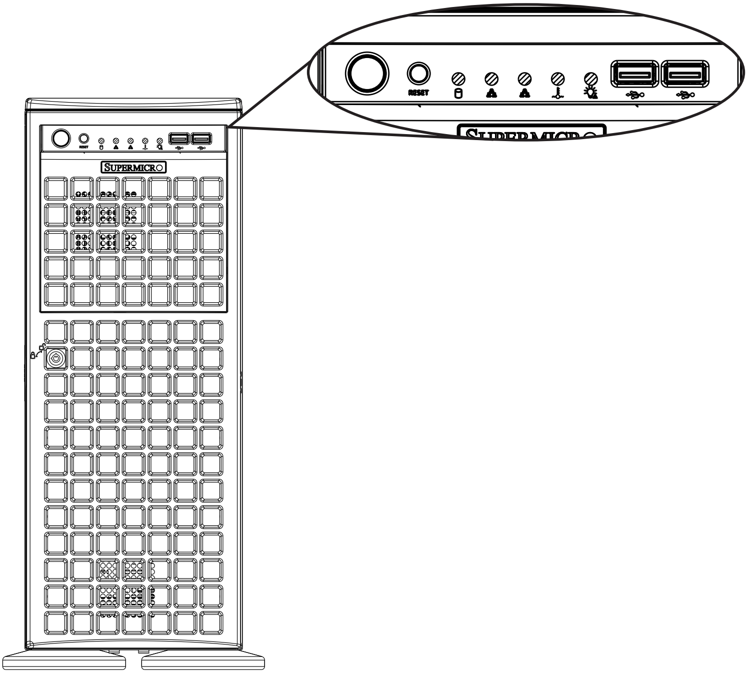
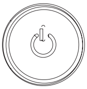


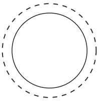
Figure 4-1: Front LEDs

4-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are power on/off button and a reset button.



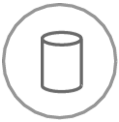
- **Power:** The main power switch is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system. Therefore, you must unplug system before servicing.



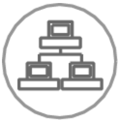
- **Reset:** The reset button is used to reboot the system.

4-3 Control Panel LEDs

The control panel located on the front of the SC747 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



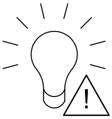
- **HDD:** Indicates IDE channel activity. SAS/SATA drive, SCSI drive, and/or DVD-ROM drive activity when flashing.



- **NIC1:** Indicates network activity on GLAN1 when flashing.

- **NIC2:** Indicates network activity on GLAN2 when flashing.

- **Overheat/Fan Fail:** When this LED flashes it indicates a fan failure. When continuously on (not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly. This LED will remain flashing or on as long as the overheat condition exists.



- **Power Fail:** Indicates a power failure to the system's power supply units.

4-4 Drive Carrier LEDs

Your chassis uses SAS/SATA drives.

SAS/SATA Drives

Each SAS/SATA drive carrier has two LEDs.

- Green: Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.
- Red: The red LED to indicate an SAS/SATA drive failure. If one of the SAS/SATA drives fail, you should be notified by your system management software.

Chapter 5

Chassis Setup and Maintenance

5-1 Overview

This chapter covers the steps required to install components and perform maintenance on the chassis. The only tool you will need to install components and perform maintenance is a Phillips screwdriver. Print this page to use as a reference while setting up your chassis

5-2 Installation and Maintenance

Installation Procedures

Removing Chassis Cover
Opening the Front Cover
Configuring the Storage Module
Installing Hard Drives
Installing the Motherboard
Installing the Heatsink

General Maintenance

General Maintenance: Systems Fans
General Maintenance: Power Supply

Warning: Except for short periods of time, do NOT operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 2: System Safety and the warning/precautions listed in the setup instructions.

5-3 Chassis Covers

The SC747 chassis has three covers, the main cover, the top cover and the front cover. This section of the manual is describes removing the main cover, and opening the front cover. Removing the top cover is described in Chapter 6, in the section titled Installing a Chassis onto a Rack.

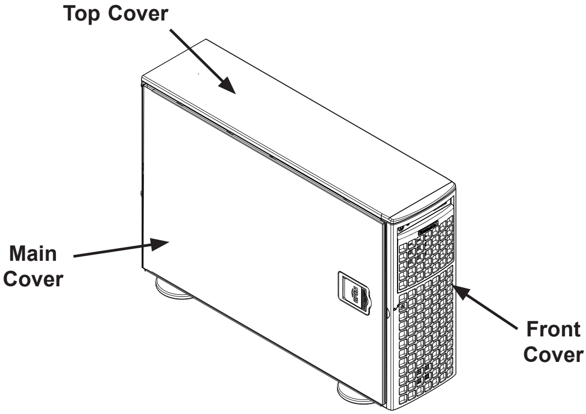


Figure 5-1: Identifying the Chassis Covers

Removing the Main Cover

Removing the Chassis Main Cover

1. Lift up and back on the main cover handle, which secures the cover to the chassis.

2. Lift the main cover off of the chassis.

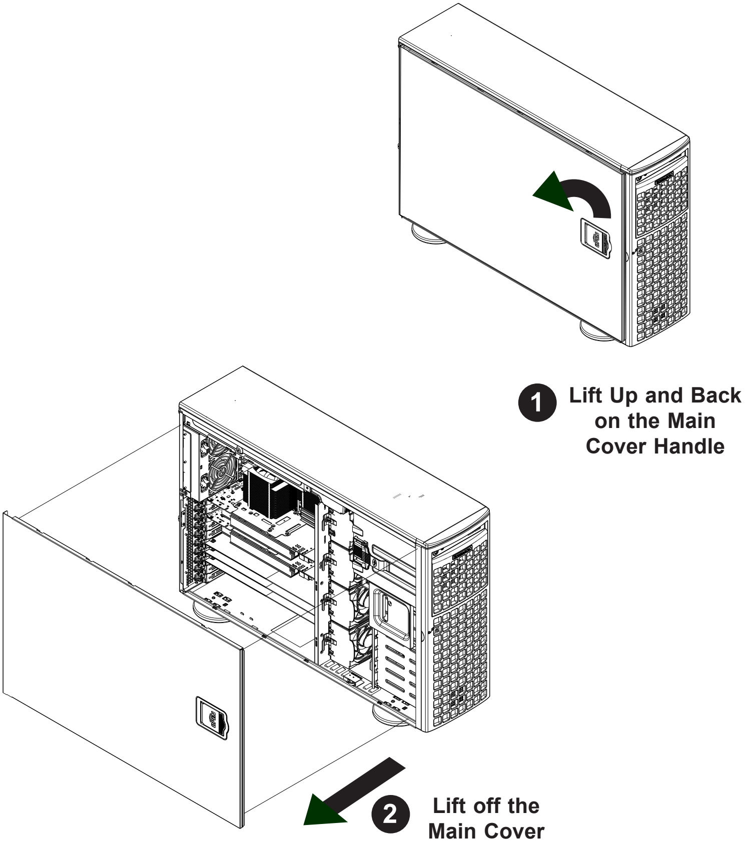

1 Lift Up and Back on the Main Cover Handle
2 Lift off the Main Cover

Figure 5-2: Removing the Main Cover

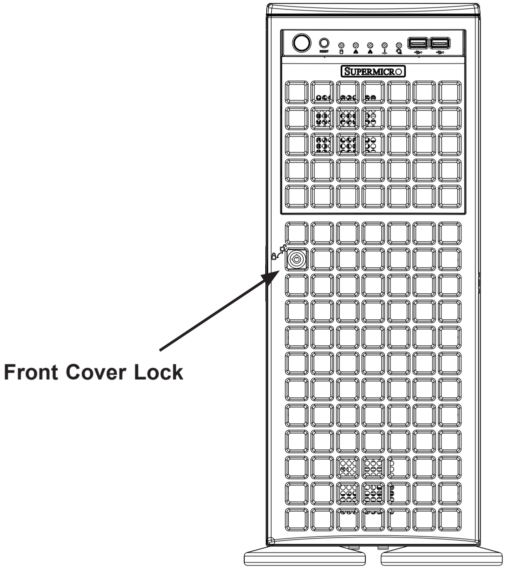


Figure 5-3: Opening the Front Cover

Opening the Front Cover

The front cover houses up to eight hot-swappable hard drives. The cover can be locked to prevent unauthorized access. The key to this lock is shipped with the system.

Opening the Front Cover

1. Unlock the front cover using the key shipped with the system.

2. Gently pull the cover open.

5-4 Configuring the the Storage Module

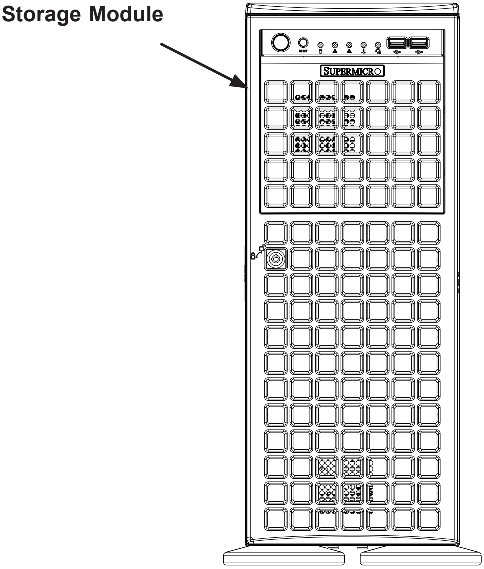

Storage Module
RESET
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Figure 5-4: Chassis in Tower Mode

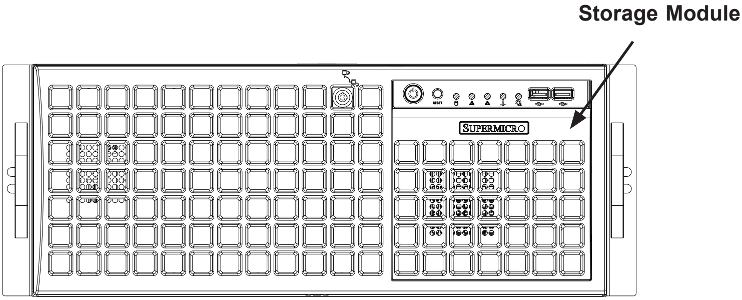

Storage Module
RESET
SUPERMICRO

Figure 5-5: Chassis in Rack Mount Mode

Tower or Rack Configuration

The SC747 chassis is shipped in tower mode and can be immediately used as desktop server. If the chassis is to be used in a rack, the storage module must be rotated 90 degrees and the storage moudule cover must be replaced. This can be done before, during, or after setup. It is not necessary to replace the storage module cover when the chassis is in the tower configuration.

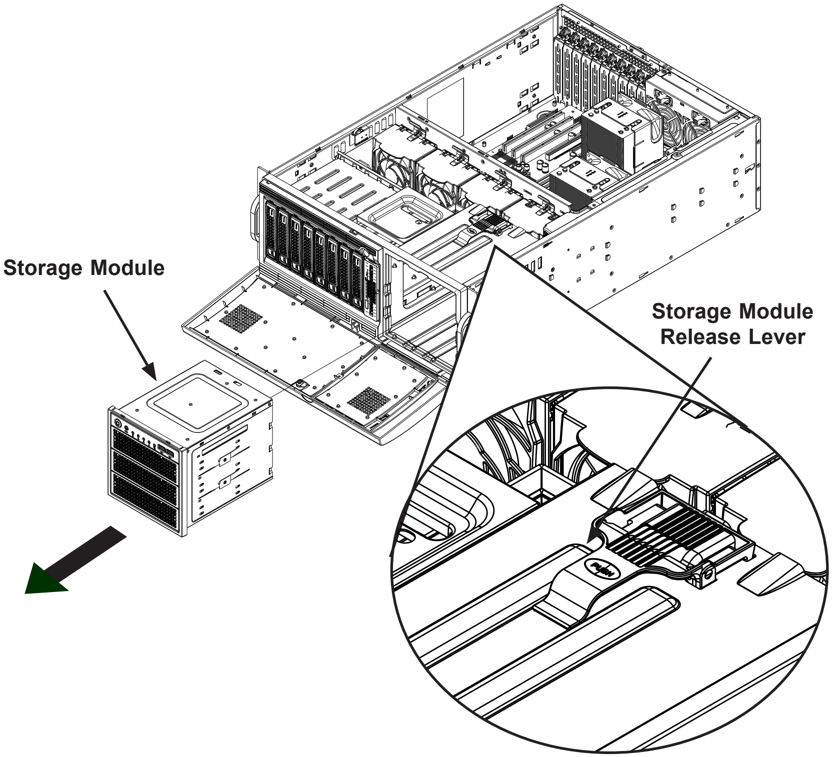


Figure 5-6: Remove the Storage Module

Rotating the Storage Module for Rack Mounting

1. Open the chassis cover.

2. Locate the storage module and disconnect any cables from the storage module to any component in the chassis.

3. Push the storage module release lever. This lever unlocks the storage module.

4. Grasp the external edges of the storage module and pull the unit from the chassis.

5. Turn the storage module 90 degrees (as illustrated).

6. Reinsert the module into the chassis and reconnect the cords.

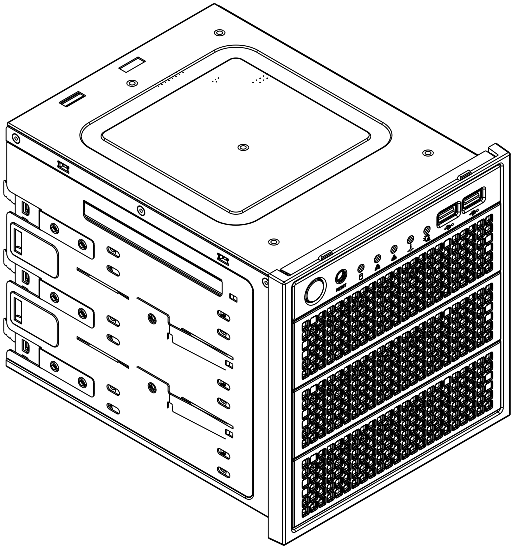


Figure 5-7: Chassis Storage Module

Installing Drives in the Storage Module

The storage module includes three full sized drive bays and the front LED panel. The storage module can be configured in one of three ways:

1. Add up to three extra hard drives to the drive trays.
2. Add up to three peripheral drives (CD-ROM, DVD-ROM, etc.) drive trays.
3. Add five hot-swappable hard drives to the storage module. This configuration requires a mobile rack. More information on mobile rack installation can be found in the appendices at the end of this manual.

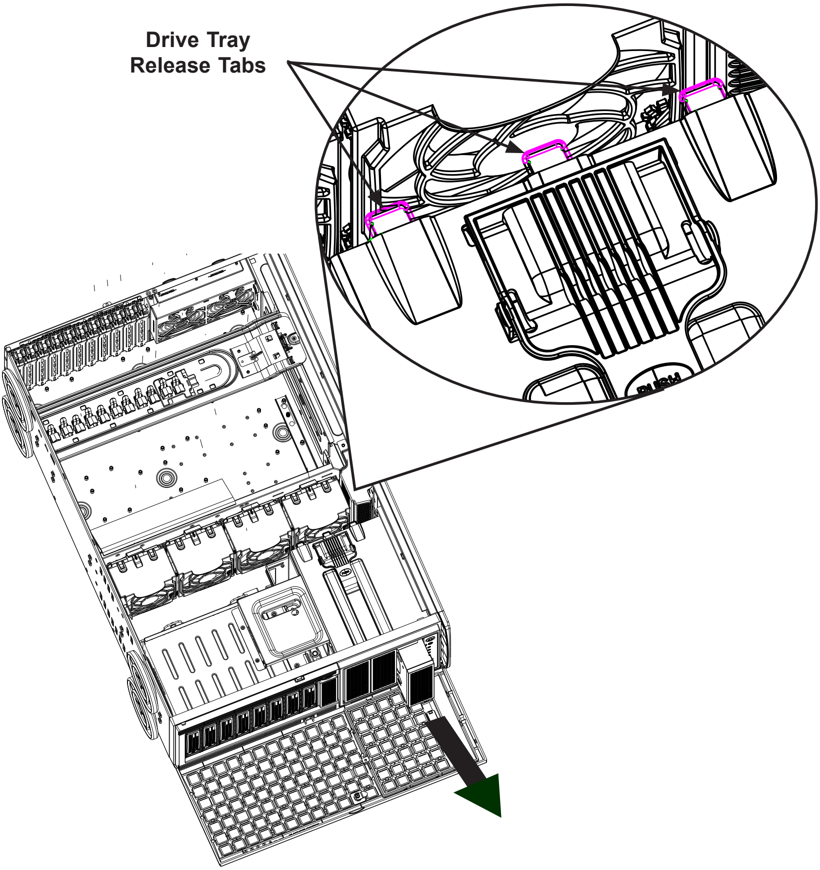


Figure 5-8: Removing a Drive Carrier

Adding Hard Drives to the Drive Carriers

1. Open the chassis cover.
2. Locate the drive tray release tab for the slot you want to place the peripheral drive.
3. Push the drive tray toward the front of the chassis.

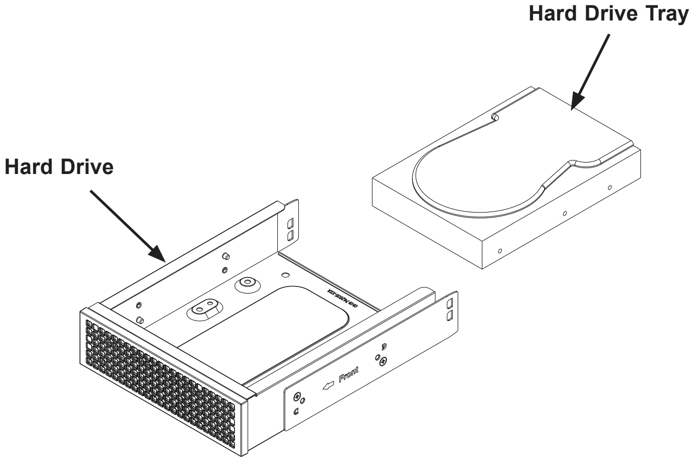


Figure 5-9: Adding a Hard Drive to the Drive Carrier

4. Place the hard drive to the hard drive tray. Make sure The hard drive can be SAS or SCSI depending on your motherboard. The hard drive may not completely fill the tray.

5. Secure the hard drive to the carrier with four screws from the bottom.

6. Slide the hard drive into the chassis until the carrier clicks into place.

7. Repeat these steps for each hard drive carrier.

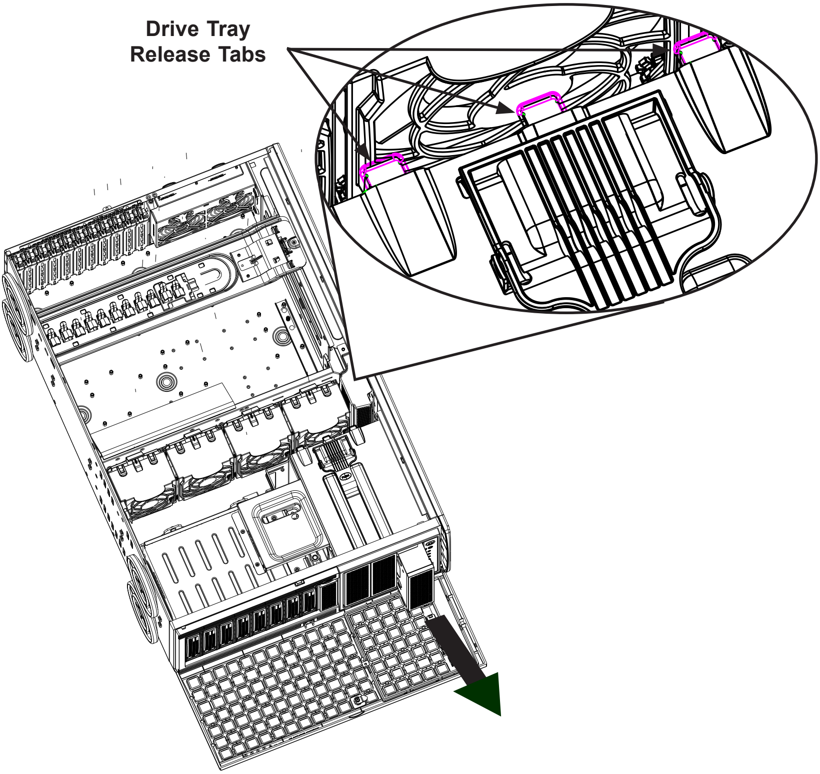


Figure 5-10: Removing a Drive Tray

Adding up to three peripheral drives (DVD-ROM, CD-ROM, floppy drive, etc.) to the drive trays:

Adding Peripheral Drives

1. Open the chassis cover.

2. Locate the drive tray release tab for the slot you want to place the peripheral drive.

3. Push the drive tray toward the front of the chassis.

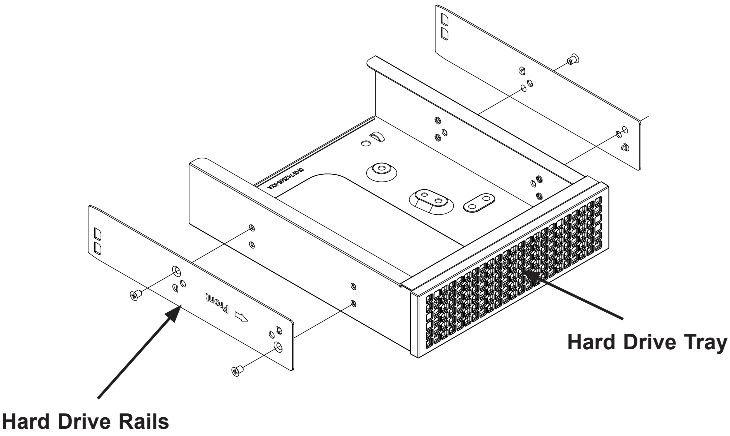


Figure 5-11: Adding Hard Drive Rails to the DVD-ROM Drive

4. Remove the hard drive tray rails from the hard drive tray. To do this, you must remove two screws from each side.

5. Attach the rails to a DVD-ROM, CD-ROM, floppy drive, or other peripheral. The rails should fit any standard sized peripherals.

6. Slide the peripheral into the chassis until the tray clicks into place.

7. Repeat these steps for each hard drive tray.

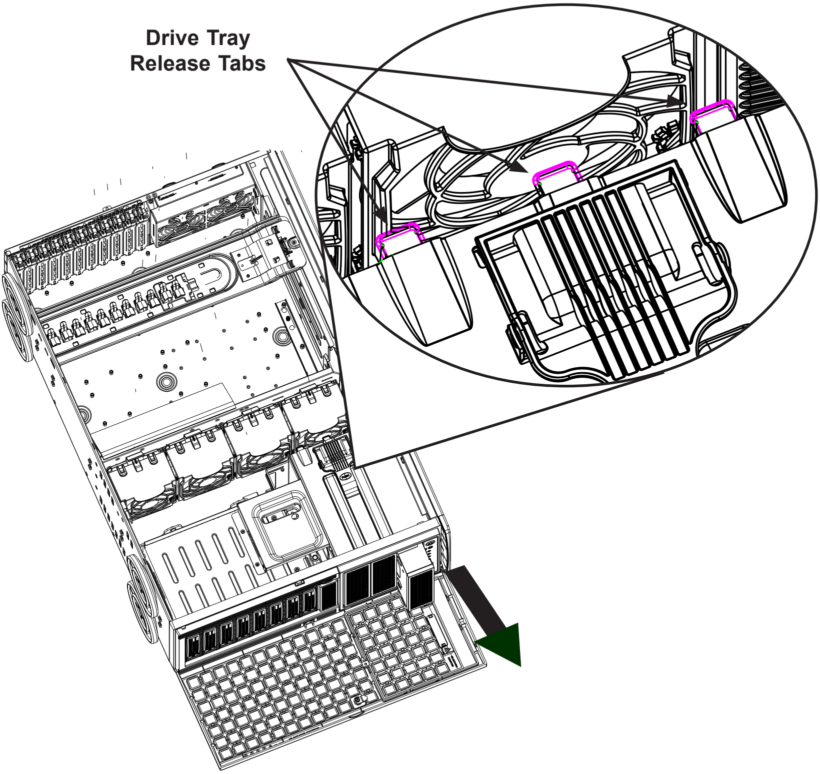


Figure 5-12: Removing a Drive Tray

Adding Five Hard Drives Using a Supermicro Mobile Rack

The SC747 chassis accepts a CSE-M35S (SCSI) or CSE-M35T-1/CSE-M35TQ mobile rack to install extra hot swappable hard drives. The mobile rack goes into the storage module which goes into the chassis.

For more information on mobile rack installation and use, refer to the appendix located at the end of this manual.

Adding Hard Drives to a Supermicro Mobile Rack

1. Open the chassis cover.
2. Locate the drive release tabs.

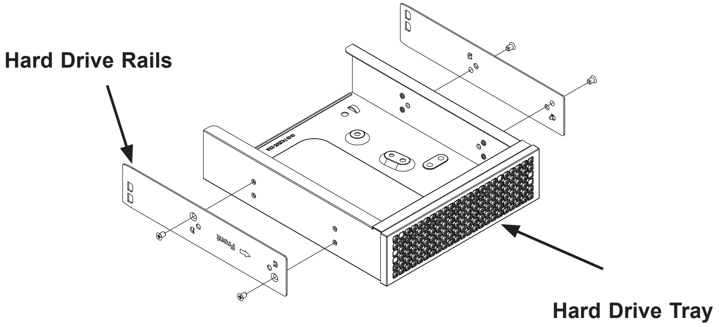


Figure 5-13: Removing the Hard Drive Rails

3. Pull the first drive release tab and push the drive tray toward the front of the chassis. Repeat this for all three tabs.

4. Remove the hard drive tray rails from the hard drive tray. To do this, you must remove two screws from each side. Do this for all three hard drive trays.

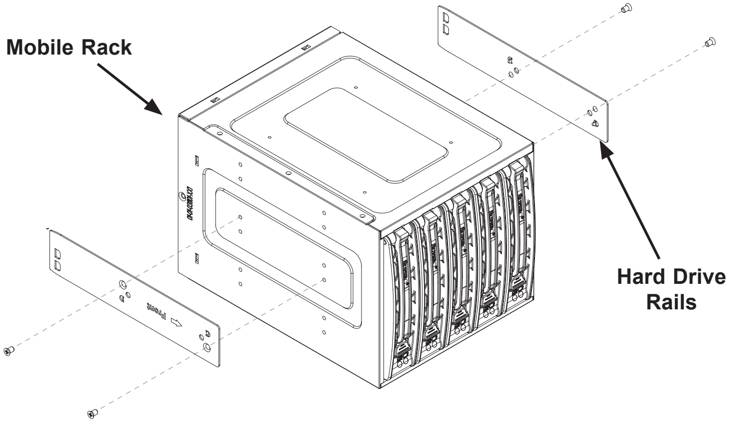


Figure 5-14: Adding Hard Drive Rails to a Storage Rack

5. Attach the rails to a DVD-ROM, CD-ROM, floppy drive, or other peripheral. The rails should fit any standard sized peripherals.

6. Install all six hard drive rails to the mobile rack. Each individual rail requires two screws. Also, make sure the arrow on the rail points toward the front of the chassis.

7. Slide the mobile rack into the storage module and chassis.

5-5 Installing Hard Drives

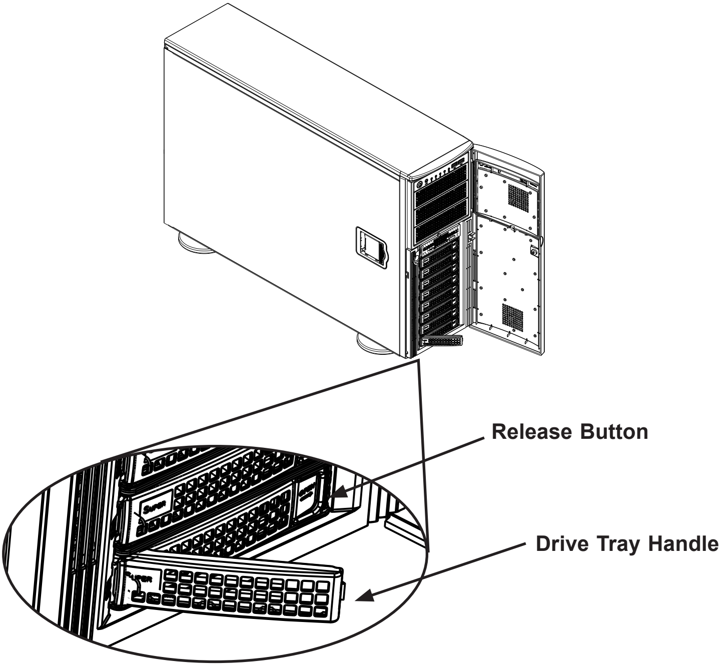


Figure 5-15: Installing Hard Drives

Installing Hard Drives into the Chassis

The drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays.

Installing Hard Drives

1. Unlock and open the chassis cover.

2. Press the release button to extend the drive tray handle.

3. Using the handle, pull the drive tray out by the handle. The drive is hot swappable; there are no cables to disconnect.

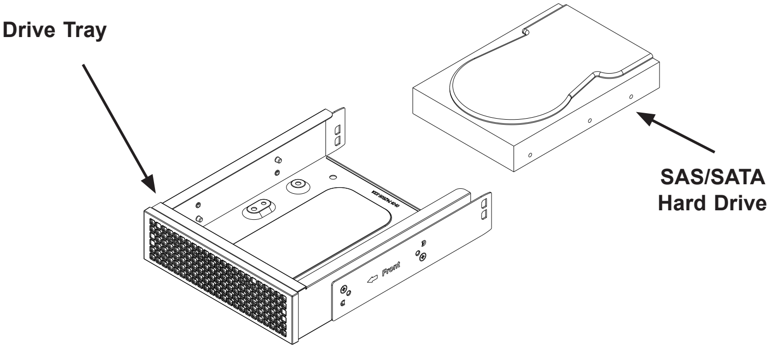


Figure 5-16: Removing a Dummy Drive Tray

4. Remove the screws holding the drive tray to the dummy drive.

5. Place a hard drive in the drive tray.

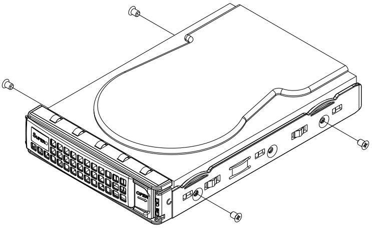


Figure 5-17: Installing a Hard Drive

6. Secure the hard drive to the tray using four screws.

7 Insert the hard drive into the chassis. To do this:

7a. Press the hard drive release button to extend the drive tray handle.

7b. Insert the hard drive into the chassis and close the handle to lock the hard drive into place.

5-6 Installing the Motherboard

I/O Slot Shield Installation

The I/O shield holds the motherboard ports in place. Install the I/O shield before you install the motherboard.

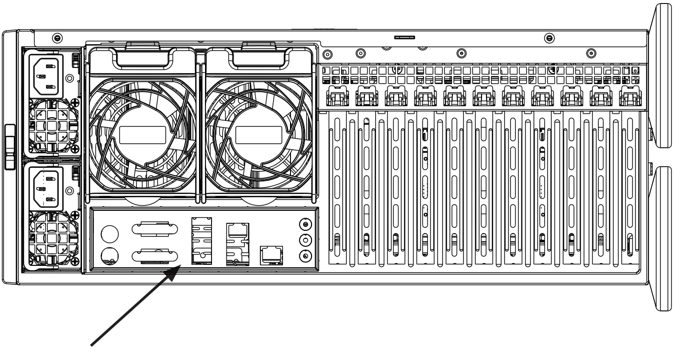


Figure 5-18: SC747 Chassis I/O Shield

Installing the I/O shield:

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, and precautions.
2. Open the chassis cover.
3. Choose the proper I/O shield for the motherboard you are installing.
4. With the illustrations facing the outside of the chassis, place the shield into the space provided. Once installed, the motherboard ports will hold the I/O shield in place.

Permanent and Optional Standoffs

Standoffs prevent short circuits by securing space between the motherboard and the chassis surface. The SC747 chassis packaging includes optional standoffs (hexagon shaped posts). These standoffs accept the rounded Phillips head screws included in the SC747 accessories packaging.

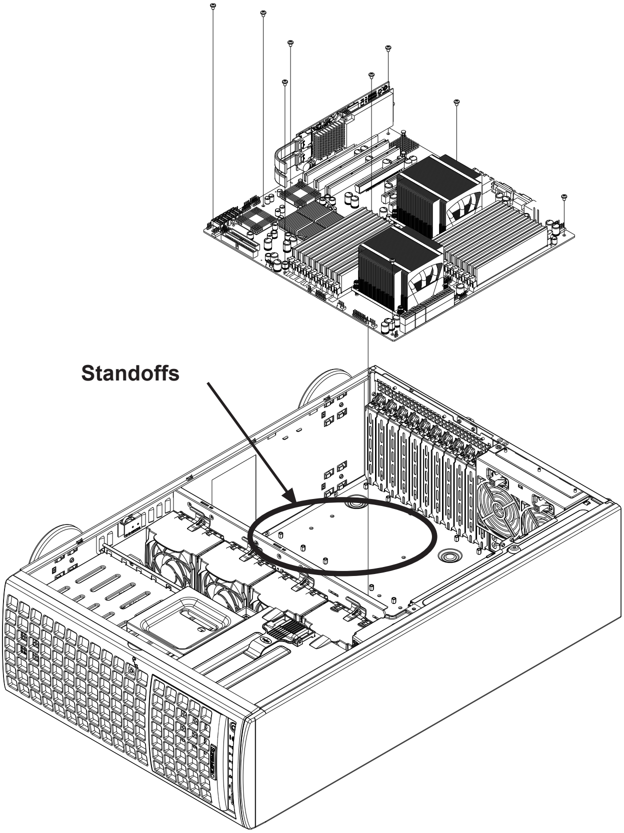


Figure 5-19: Chassis Standoffs

Installing the Motherboard

Installing the Motherboard into the Chassis

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, and precautions.

2. Disconnect the power supply and lay the chassis on a flat surface.

3. Open the chassis cover.

4. As required by your motherboard, install standoffs in any areas that do not have a permanent standoff. To do this:

    A. Place a hexagonal standoff screw through the bottom the chassis.

    B. Secure the screw with the hexagon nut (rounded side up). Do not exceed more than eight pounds of torque when tightening the motherboard.

5. Lay the motherboard on the chassis aligning the permanent and optional standoffs.

6. Secure the motherboard to the chassis using the rounded, Phillips head screws. Do not exceed eight pounds of torque on the motherboard.

7. Secure the CPU(s), heatsinks, and other components to the motherboard, chassis, and/or backplane as needed.

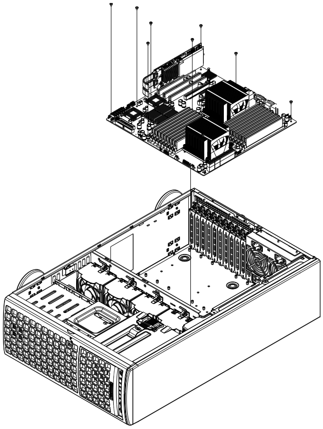


Figure 5-20: Installing the Motherboard

Installing the Active Heatsink

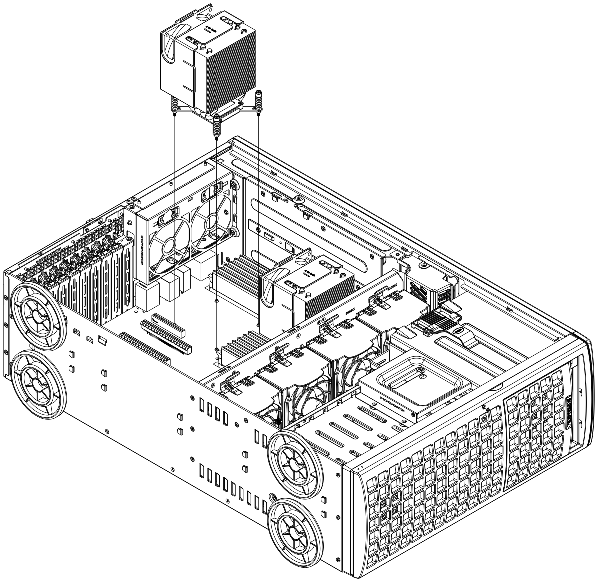


Figure 5-21: Installing the Active Heatsink

Installation of the active heatsink will vary, depending upon the type of motherboard used in the chassis. See the information which was supplied with the motherboard for details on how to properly install the active heatsink on your specific motherboard.

Power Supply Connections

Connect each of the following cables, as required, by your motherboard manufacturer. In some instances, some cables may not need to be connected. Some cables may not be available with your model.

Power Supply Cable			
Name	**Qty**	**Connects to:**	**Description**
20-pin or 24-pin power cable	1	motherboard	20-pin or 24-pin power cable provides electricity to the motherboard. and has twenty to twenty-four yellow, black, gray, red, orange, green and blue wires.
HDD (Hard Drive) power cable	2	backplane	Each cable has three connectors (two Hard Drive [HDD] and one Floppy Drive [FDD]). Attach the HDD connectors to the backplane. **If you are using a Supermicro backplane, the FDD connector does not need to be attached.**
8-pin motherboard cable	1	motherboard	Provides power to the motherboard CPU. This cable has two black and two yellow wires.
4-pin motherboard cable	1	motherboard	Provides power to PCI expansion card. This cable has two black and two yellow wires.
5-pin SMBus power cable (small)	1	motherboard	Allows the SM (System Management) bus to monitor power supply
2-pin INT cable	1	motherboard	Intrusion detection cable allows the system to log when the server chassis has been opened.

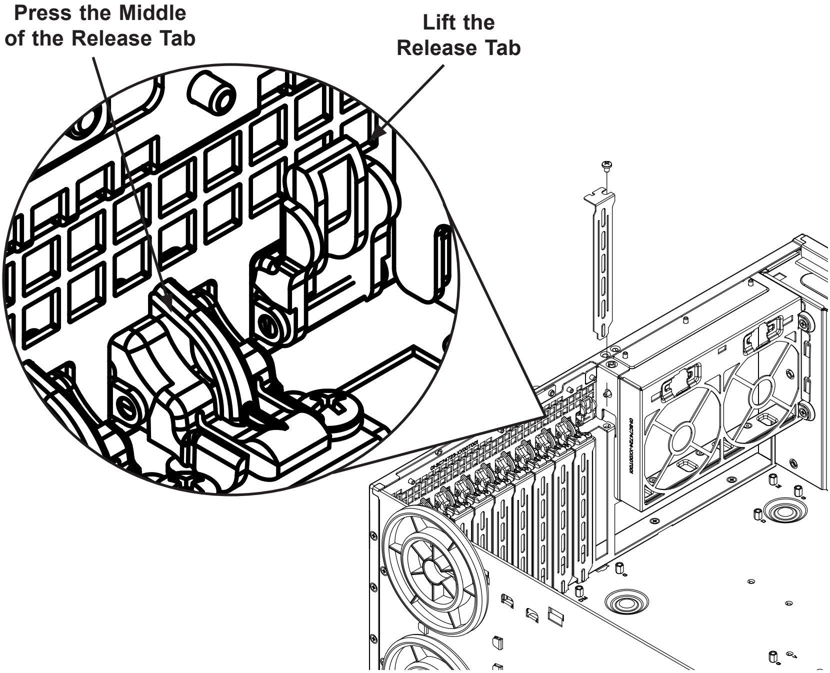

Press the Middle of the Release Tab
Lift the Release Tab

Figure 5-22: Add-on Card/Expansion Card Port

Configuring the Add-on Card/Expansion Slot

After the motherboard installation, install add-on cards to the chassis, such as PCI cards.

Installing Add-on/Expansion Cards

1. Locate the release tab on the top of the PCI slot bracket.
2. Gently apply pressure in the middle of the release tab to unlock the PCI slot bracket.
3. Pull the release tab upward.

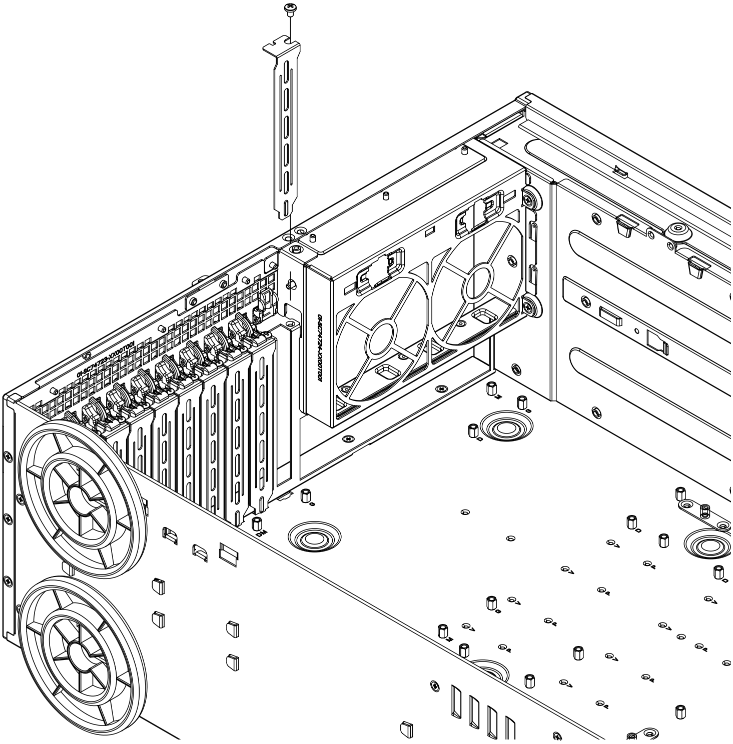


Figure 5-23: Removing the PCI Card Slot Guard

4. Remove the screw holding the bracket in place and pull the bracket from the chassis.

5. Install your PCI card or other add-on card into the PCI slot bracket and motherboard. To do this, slide the PCI card (with "L" bracket) into the PCI slot and secure the card to the motherboard.

6. Push the PCI bracket release tab down until it locks into place with an audible "click".

7. Secure the PCI card with the screw previously removed from the chassis.

8. Repeat this process with each PCI card you want to install into the chassis.

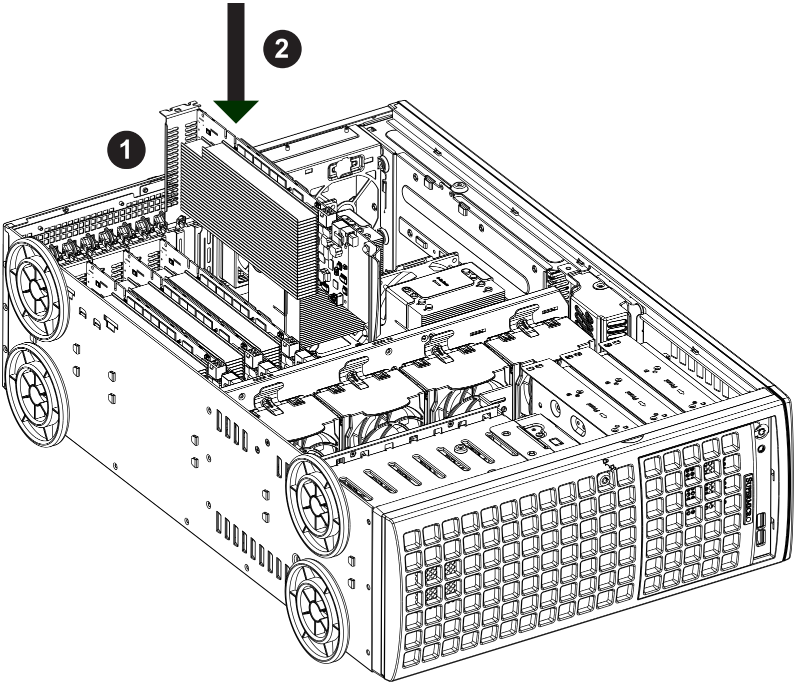


Figure 5-24: Installing Graphics Cards

Installing Double-Width Graphics Cards

The SC747 chassis is designed to support up to four double-width, high-end graphics cards. A (part number) bracket is recommended for this application and may be purchased by visiting the Supermicro Web site at http://www.supermicro.com and clicking on the Where to Buy link.

Installing Double-Width Graphics Cards

1. Insert the graphics card into the appropriate add-on card slot

2. Slide the graphics card down onto the motherboard.

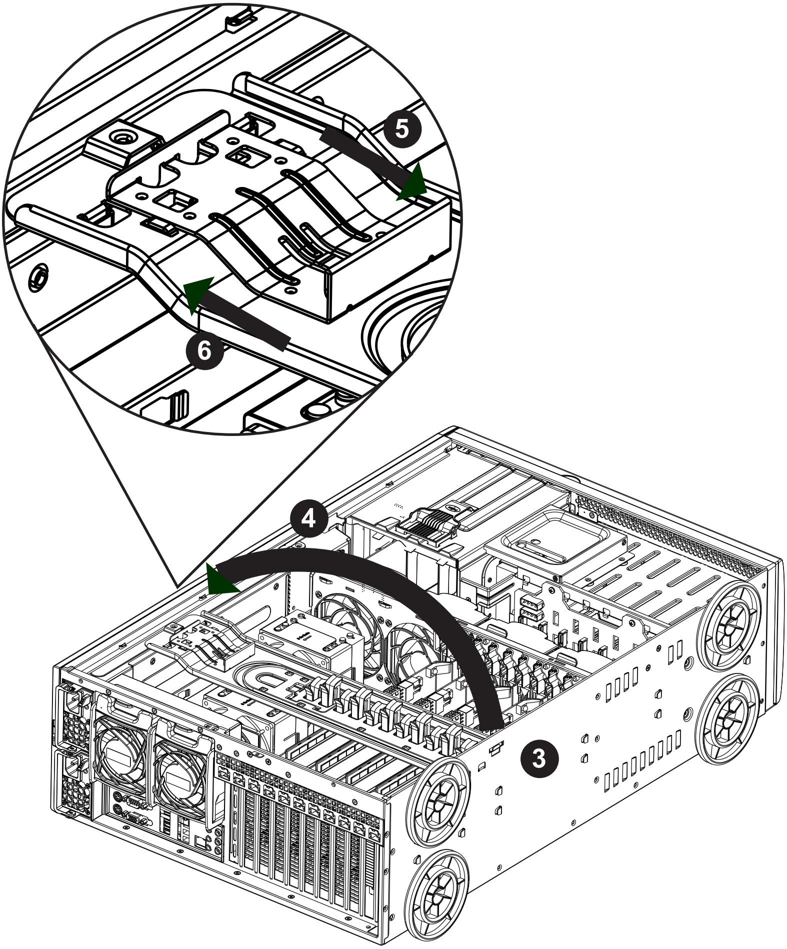


Figure 5-25: Closing the Graphics Card Bracket

3. Place the tabs of the (part number) graphics card bracket into the slots on the wall of the chassis as illustrated.

4. Lower the bracket down onto the card

5. Pull back the slide lock and lower it over the raised tab as illustrated.

6. Push the slide lock forward, allowing the pins of the slide lock to penetrate the thru holes in the raised tab.

5-7 System Fans

Six heavy-duty fans provide cooling for the chassis. Four fans are located in the mid-section of the chassis with two fans in the rear. These fans circulate air through the chassis as a means of lowering the chassis internal temperature.

The fans come pre-installed to the chassis. Each fan is hot-swappable and can be replaced without removing any connections.

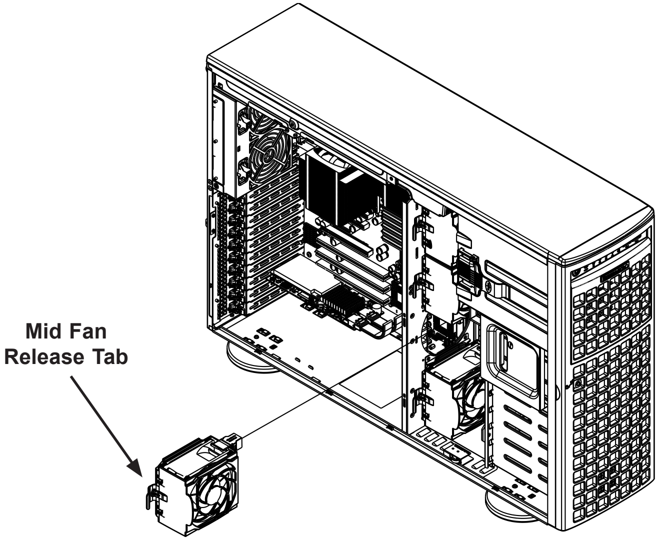


Figure 5-26: Front Chassis Fans

Replacing Mid-System Fans

Replacing Mid-System Fans

1. Determine which fan has failed. Because the fans are hot-swappable, the chassis does not need to be powered-down.

2. Press the fan release tab and lift the failed fan from the chassis. Mid fans must be pulled straight out of the chassis.

3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans. As soon as the fan is connected, it will begin working.

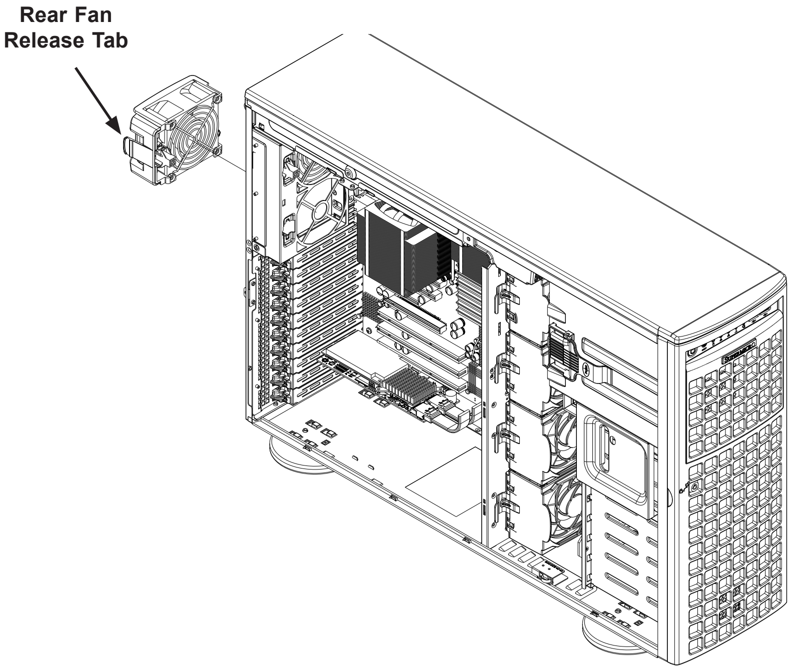


Figure 5-27: Rear Chassis Fans

Replacing Rear System Fans

Replacing the Rear System Fan

1. Determine which fan is not operation
2. Press the rear fan release tab.
3. Pull the fan away from the chassis by pulling out the top first.
4. Place the new fan in the chassis, inserting the bottom of the fan first.
5. Push the fan fully into the housing until the fan clicks into place.

5-8 Power Supply

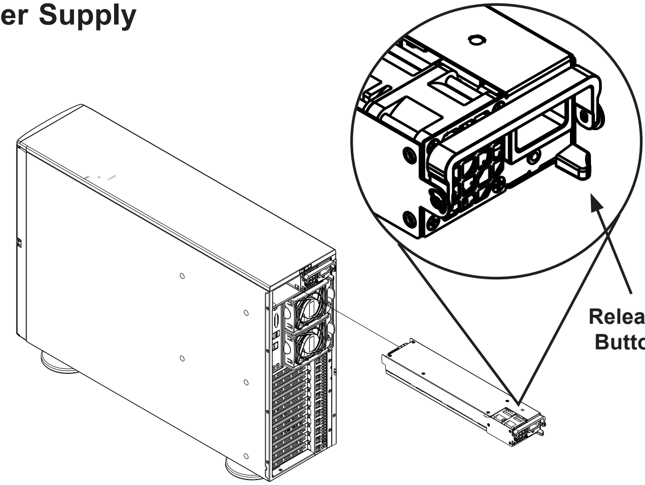


Figure 28: Power Supply Release Button

The SC747 chassis has a 1400W (redundant) power supply. This power supply is auto-switching capable. This enables it to automatically sense and operate at a 100v to 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

Replacing the Power Supply

With a redundant power supply, the system automatically switches to the second power supply if the first should fail.

Replacing the Power Supply

1. Power down the chassis and unplug the power cord. If your chassis includes a redundant power supply (at least two power modules), you can leave the server running and remove only one power supply.

2. Push the release tab (on the back of the power supply) as illustrated.

3. Pull the power supply out using the handle provided.

4. Replace the failed power module with the same model.

5. Push the new power supply module into the power bay until you hear a click.

6. Plug the AC power cord back into the module and power up the server.

Notes

Chapter 6

Rack Installation

6-1 Overview

This chapter provides a quick setup checklist to get your chassis up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time.

6-2 Unpacking the System

You should inspect the box the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold your chassis. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

6-3 Preparing for Setup

The box your chassis was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).

- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

General Server Precautions

- Review the electrical and general safety precautions that came with the components you are adding to your chassis.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug hard drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

6-4 Installing the Chassis onto a Rack

This section provides information on installing the SC747 chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

NOTE: The outer rail is adjustable from 26" to 38.25".

Removing the Chassis Cover and Feet

The SC747 chassis is shipped with the chassis cover and feet pre-installed. Both the feet and cover must be removed for before installing the rails.

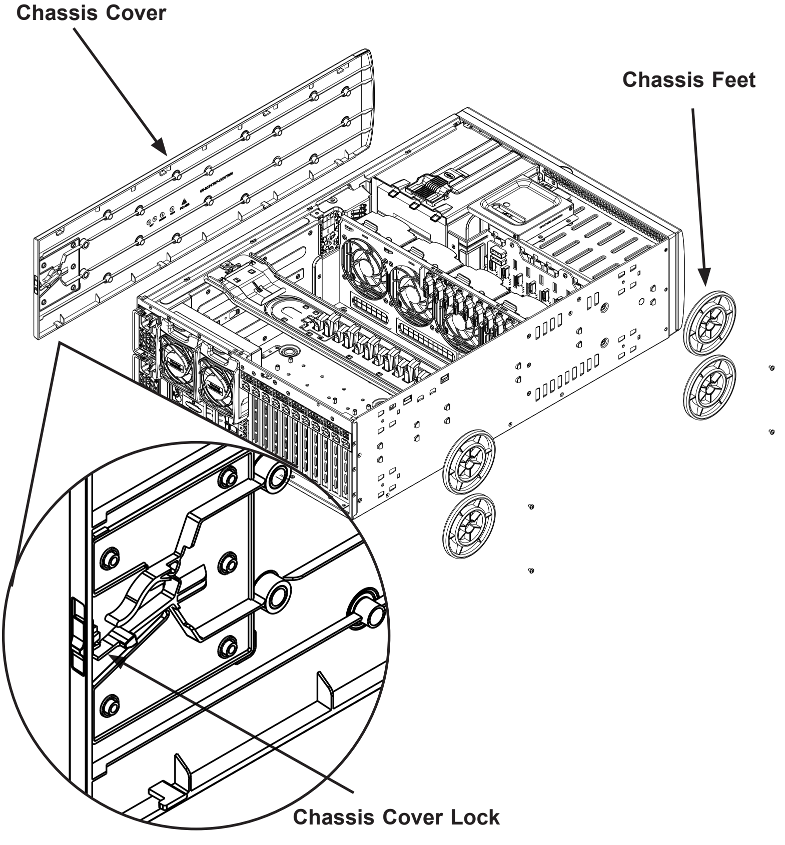


Figure 6-1: Removing the Feet and Chassis Top Cover

Removing the Chassis Top Cover

1. Locate the chassis cover lock (blue lever) at the rear of the chassis cover.

2. Slide the chassis cover lock to the right and push chassis cover forward.

3. Lift the chassis top cover off the chassis.

Removing the Chassis Feet

1. Place the chassis on its side with the chassis side cover facing upward.

2. Remove the screw holding the chassis foot in place.

3. The foot lock is a tab located in the center of the foot that prevents the foot from sliding. Using a flat head screwdriver, **gently** lift the foot lock upward and slide the foot toward the rear of the chassis.

4. Repeat steps 2 and 3 with each remaining foot.

Identifying the Sections of the Rack Rails

The chassis package includes two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

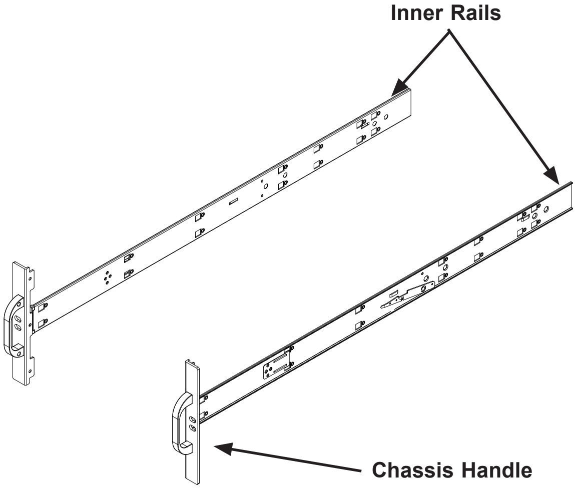


Figure 6-2: Identifying the Inner Rails and Chassis Handles

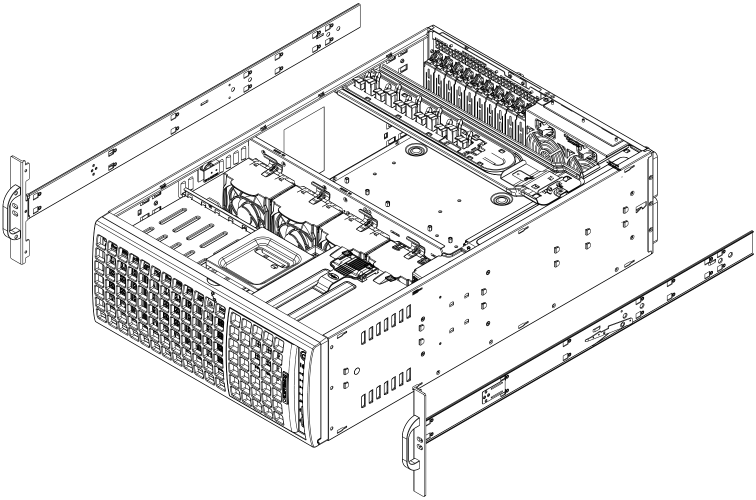


Figure 6-3: Installing the Inner Rack Rails

Installing the Chassis Handles and Inner Rails

Installing the Inner Rails

1. Locate the chassis handles and handle screws.

2. Align the chassis handle with the front of the chassis and secure with the three chassis handle screws.

3. Repeats steps 1 and 2 with the other handle.

4. Locate the inner rails and screws in the shipping package.

5. Align the inner rails against the chassis, as shown. Confirm that the rails are flushed against the edge of the chassis.

6. Tighten the screws. Do not over-tighten.

7. Repeat steps 5 and 6 with the other inner rail.

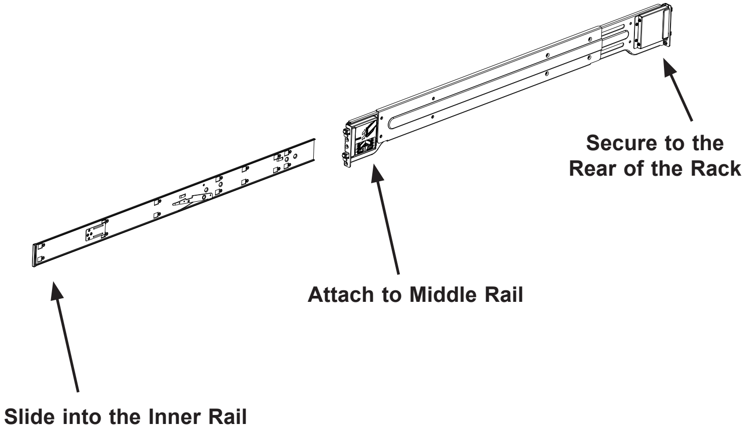

Secure to the
Rear of the Rack
Attach to Middle Rail
Slide into the Inner Rail

Figure 6-4: Assembling the Outer Rails

Installing the Outer Rails to the Rack

Installing the Outer Rails

1. Attach the rear bracket to the middle bracket.

2. Adjust both the brackets to the proper distance so that the rail fits snugly into the rack.

3. Secure the rear of the outer rail with two M5 screws and the rear of the rack. **NOTE:** The outer rail is adjustable from approximately 26" to 38.25".

4. Repeat steps 1-3 for the left outer rail.

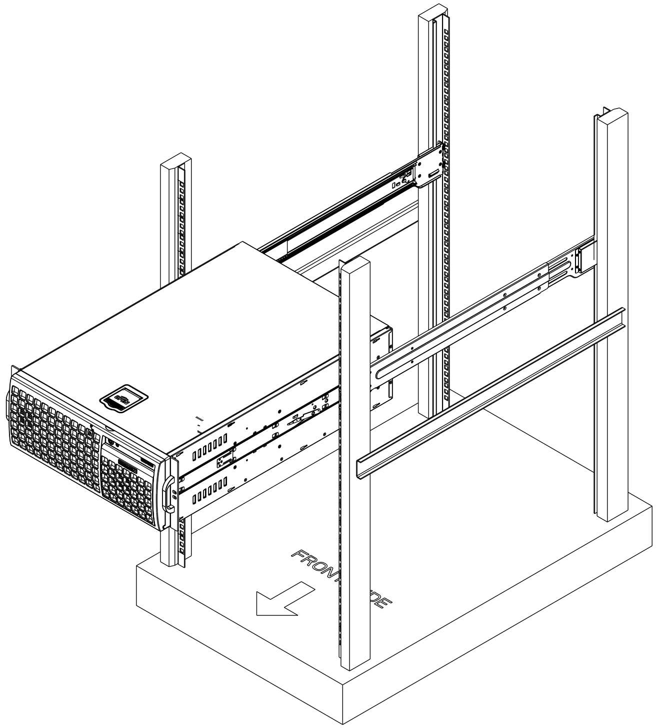


Figure 6-5: Installing the Rack Rails

Installing the Chassis into a Rack

Installing the Chassis

1. Confirm that chassis includes the inner rails and the outer rails.

2. Align the inner chassis rails with the front of the outer rack rails (C).

3. Slide the inner rails into the outer rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the chassis has been pushed completely into the rack, you should hear the locking tabs "click" into the locked position.

6-5 Tower Mounting Instructions

The SC747 chassis is shipped with the chassis cover and feet pre-installed. To use the chassis as a desktop server, no other installation is required.

Use the instructions in this section if you have converted the chassis for rack use and need to return the chassis to tower mounting.

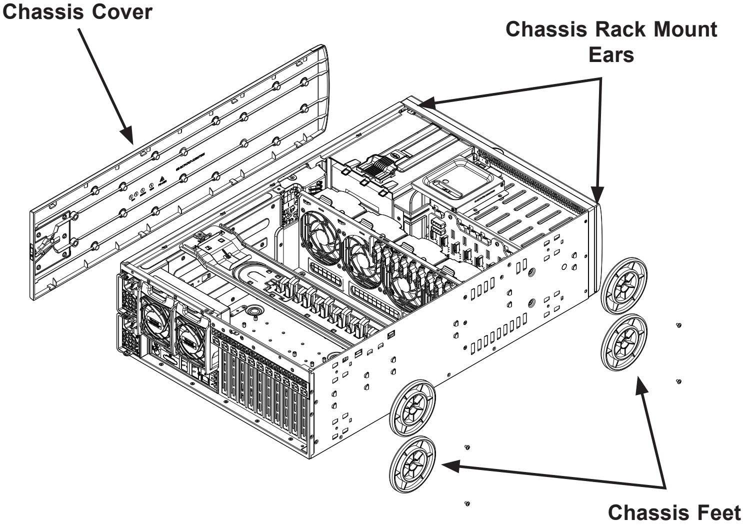


Figure 6-6: Adding Chassis Feet and Top Cover

Installing the Chassis Cover

Installing the Cover

1. Remove the rack mount ears.

2. Align the cover post with the corresponding holes on the top of the chassis and place the cover on top of the chassis. The cover should overhang approximately one-half inch over the front of the chassis.

3. Slide the chassis cover toward the rear of the chassis to lock the cover into place.

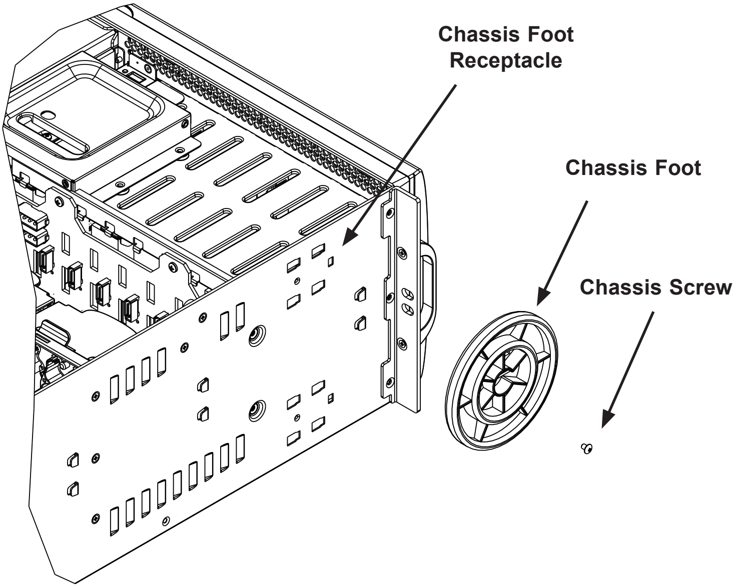

Chassis Foot Receptacle
Chassis Foot
Chassis Screw

Figure 6-7: Placing Chassis Feet

Installing Feet on the Chassis

Installing the Chassis Feet

1. Place the chassis foot in the foot receptacle and slide the foot toward the front of the chassis. The foot should lock into place.

2. Secure the foot to the chassis using one screw enclosed in the packaging.

3. Repeat steps 1 and 2 for the remaining three chassis fee

Notes

Appendix A

SC747 Chassis Cables

A-1 Overview

This appendix lists supported cables for your chassis system. It only includes the most commonly used components and configurations. For more compatible cables, refer to the manufacturer of the motherboard you are using and our Web site at: www.supermicro.com.

A-2 Cables Included with SC747TQ Chassis (SAS/SATA)

SC747TQ-R1400			
Part #	**Type**	**Length**	**Description**
CBL-0157L	Cable	40cm	8-pin to 8-pin ribbon cable with tube for SGPIO
CBL-0208L	Cable	70cm	SATA Round S-S
CBL-0071L	Cable	30"	Round 16 to 16 pin ribbon FP cable
CBL-0216L	Cable	200mm	4-pin to 4 pin middle fan power extension (PWM)
CBL-0286L	Cable	30cm	4-pin to 4 pin rear fan pwr ext w/ square header(PWM)

A-4 Compatible Cables

These cables are compatible with the SC747 chassis.

Alternate SAS/SATA Cables

Some compatible motherboards have different connectors. If your motherboard has only one SAS connector that the SAS/SATA cables must share, use one of the following cables. These cables must be purchased separately.

Cable Name: SAS Cable **Quantity:** 1

Part #: CBL-0175L
Alt. Name: "Big Four"

Description: This cable has one SFF-8484 (32-pin) connector on one end and 4 SAS connectors (7 pins each) at the other. This cable connects from the Host (motherboard or other controller) to the backplane SAS hard drive port.

Cable Name: SAS Cable **Quantity:** 1

Part #: CBL-0116
Alt. Name: iPass or "Small Four"

Description: This cable has one ipass (SFF-8087/mini-sas) connector (36 pins) at one end and 4 SAS connectors on one end. This cable connects from the Host (motherboard or other controller) to the backplane SAS hard drive port.

Extending Power Cables

Although Supermicro chassis are designed with to be efficient and cost-effective, some compatible motherboards have power connectors located in different areas.

To use these motherboards you may have to extend the power cables to the mother boards. To do this, use the following chart as a guide.

Power Cable Extenders		
Number of Pins	**Cable Part #**	**Length**
24 pin	CBL - 0042	7.9”(20 CM)
20 pin	CBL - 0059	7.9”(20 CM)
8 pin	CBL - 0062	7.9”(20 CM)
4 pin	CBL - 0060	7.9”(20 CM)

Front Panel to the Motherboard

The SC747 chassis includes a cable to connect the chassis front panel to the motherboard. If your motherboard uses a different connector, use the following list to find a compatible cable.

Front Panel to Motherboard Cable (Ribbon Cable)		
Number of Pins (Front Panel)	**Number of Pins (Motherboard**	**Cable Part #**
16 pin	16 pin	CBL - 0049
16 pin	20 pin	CBL - 0048
20 pin	20 pin	CBL - 0047
16 pin	various*	CBL - 0068
20 pin	various*	CBL - 0067

* Split cables: Use these cable if your motherboard requires several different connections from the front panel.

Notes

Appendix B

SC747 Power Supply Specifications

This appendix lists power supply specifications for your chassis system.

	1400W **(Redundant)**
MFR Part #	PWS-1K41P-1R
AC Input	1200W: 100 - 140V, 50 - 60Hz, 10.5 - 14.7 Amp 1400W: 180 - 240V, 50 - 60Hz, 7.2 - 9.5 Amp
DC Output +5V standby	4 Amp
DC Output +12V	91 Amp @ 100-140V 116 Amp @ 180-240V
With Distributor	+5V: 30 Amp +3.3V: 24 Amp -12V: 0.6 Amp

Notes

Appendix C

SAS-747TQ Backplane Specifications

To avoid personal injury and property damage, carefully follow all the safety steps listed below when accessing your system or handling the components.

C-1 ESD Safety Guidelines

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing a component from the antistatic bag.
- Handle the backplane by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the card and peripherals back into their antistatic bags when not in use.

C-2 General Safety Guidelines

- Always disconnect power cables before installing or removing any components from the computer, including the backplane.
- Disconnect the power cable before installing or removing any cables from the backplane.
- Make sure that the backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.

C-3 An Important Note to Users

- All images and layouts shown in this user's guide are based upon the latest revision available at the time of publishing. The card you have received may or may not look exactly the same as the graphics shown in this manual.

C-4 Introduction to the SAS-747TQ Backplane

The SAS-747TQ backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance.

This manual reflects SAS-747TQ Revision 1.00, the most current release available at the time of publication. Always refer to the Supermicro Web site at www.supermicro.com for the latest updates, compatible parts and supported configurations.

Jumper Settings and Pin Definitions

C-5 Front Connectors and Jumpers

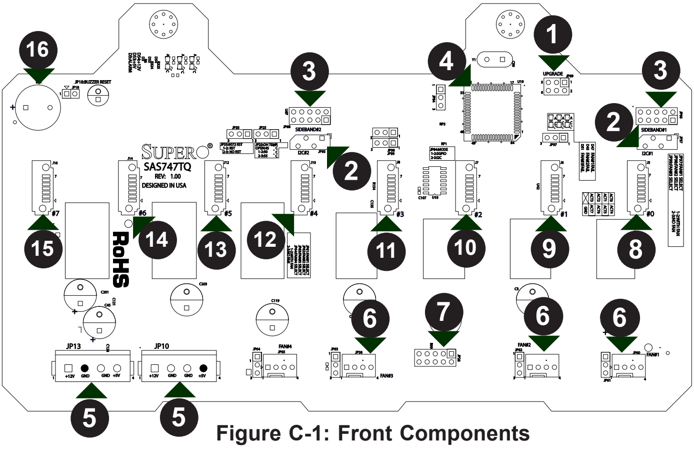

16
1
3
4
3
2
2
15
14
13
12
11
10
9
8
6
7
6
6
5
5
JP18:BUZZER RESET
UPGRADE
SIDEBAND#2
SIDEBAND#1
I2C#2
I2C#1
SUPERO
SAS747TQ
REV: 1.00
DESIGNED IN USA
RoHS
#7
#6
#5
#4
#3
#2
#1
#0
JP13
JP10
+12V
GND
GND
+5V
FAN#4
FAN#3
FAN#2
FAN#1

Figure C-1: Front Components

Front Components

Front Jumpers and Components

1. Upgrade Connector: JP69
2. I^2C Connector#1: JP37 and I^2C Connector#2 JP95
3. Sideband Connector#1: JP66 and Sideband Connector#2: JP68
4. Chip: MG9072
5. Power Connectors: (4-pin): JP10 and JP13
6. Fan Connectors: JP54, JP56, and JP60
7. ACT_IN #0-7: JP26
8. SAS Port #0: J5
9. SAS Port #1: J6
10. SAS Port #2: J7
11. SAS Port #3: J8
12. SAS Port #4: J10
13. SAS Port #5: J12
14. SAS Port #6: J14
15. SAS Port #7: J16
16. Buzzer: BZ1

C-6 Front Connector and Pin Definitions

1. Upgrade Connector

The upgrade connector, designated JP69, is used for manufacturer's diagnostic purposes only.

2. I^{2}C Connectors

The I^{2}C connectors, designated JP37 and JP95, are used to monitor HDD activity and status. See the table on the right for pin definitions.

I^{2}C Connector Pin Definitions

Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

3. Sideband Headers

The sideband headers are designated JP66 and JP68. For SES-2 to work properly, you must connect an 8-pin sideband cable. See the table to the right for pin definitions.

NOTE: SGPIO is the default setting for this backplane.

Sideband Headers

Pin #	Definition	Pin #	Definition
2	**SGPIO:** SDIN **I^{2}C:** Backplane Addressing (SB5)	1	Controller ID (SB6)
4	**SGPIO:** SDOUT **I^{2}C:** Reset (SB4)	3	GND (SB2)
6	GND (SB3)	5	**SGPIO:** SLOAD **I^{2}C:**SDA (SB1)
8	Backplane ID (SB7)	7	**SGPIO:** SCLOCK **I^{2}C:**SCL (SB0)
10	No Connection	9	No Connection

4. MG9072 Chip

The MG9072 is an enclosure management chip that supports the SES-2 controller and SES-2 protocols.

5. Backplane Main Power Connectors

The 4-pin connectors, designated JP66 and JP68 provide power to the backplane. See the table on the right for pin definitions.

Backplane Main Power 4-Pin Connector

Pin#	Definition
1	+12V
2 and 3	Ground
4	+5V

6. Fan Connectors

The 4-pin connectors, designated JP54, JP56, and JP60 provide power to the fans. See the table on the right for pin definitions.

Fan Connectors

Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	Empty

7. SAS Activity LED Header

The activity LED header, designated JP26, is used to indicate the activity status of each SAS drive. The Activity LED Header is located on the front panel. For the Activity LED Header to work properly, connect using a 10-pin LED cable.

SAS Activity LED Header Pin Definitions

Pin #	Definition	Pin #	Definition
1	ACT IN#0	6	ACT IN#4
2	ACT IN#1	7	ACT IN#5
3	ACT IN#2	8	ACT IN#6
4	ACT IN#3	9	ACT IN#7
5	Empty	10	Ground

8-15. SAS Ports

The SAS ports are used to connect the SAS drive cables. The 8 ports are designated #0 - #7. Each port is also compatible with SATA drives.

C-7 Front Jumper Locations and Pin Definitions

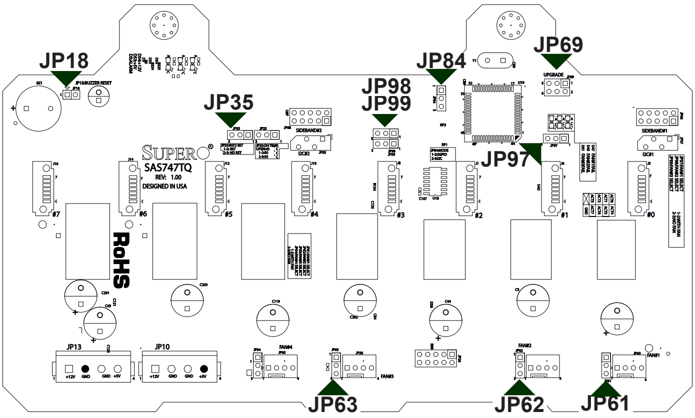
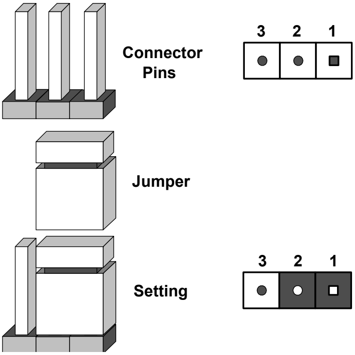

JP18
JP35
JP98
JP99
JP84
JP69
JP97
SUPERO
SAS747TQ
REV: 1.00
DESIGNED IN USA
RoHS
JP13
JP10
JP63
JP62
JP61

Figure C-2: Jumper Locations

Explanation of Jumpers

To modify the operation of the backplane, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.


Connector Pins
3 2 1
Jumper
Setting
3 2 1

Jumper Settings		
Jumper	**Jumper Settings**	**Note**
JP35	1-2: Reset 2-3: No reset	MG9072 chip reset

Socket Settings		
Socket	**Socket Setting**	**Note**
JP18	Connected to front panel	Buzzer reset* Press once to disable buzzer Press twice to enable buzzer

*The buzzer sound indicates that a condition requiring immediate attention has occurred.

The buzzer alarm is triggered by the following conditions:

1. Hard drive failure

2. Fan failure

3. System temperature over 45º Celsius.

Fan Jumper Settings

This backplane can use up to three fans. To utilize each fan, you must configure **both jumpers** as instructed below.

Fan Jumper Settings		
Jumper	**Jumper Settings**	**Note**
JP61	1-2:Enabled 2-3:Disabled	FAN #1 enable/disable
JP97	1-2:Enabled 2-3:Disabled	FAN #1 selection for MG9072 chip
JP62	1-2:Enabled 2-3:Disabled	FAN #2 enable/disable
JP98	1-2:Enabled 2-3:Disabled	FAN #2 selection for MG9072 chip
JP63	1-2:Enabled 2-3:Disabled	FAN #3 enable/disable
JP99	1-2:Enabled 2-3:Disabled	FAN #3 selection for MG9072 chip

I^{2}C and SGPIO Modes and Jumper Settings

This backplane can utilize I^{2}C or SGPIO. SGPIO is the default mode and can be used without making changes to your jumpers. The following information details which jumpers must be configured to use I^{2}C mode or restore your backplane to SGPIO mode.

SGPIO and I^{2}C Jumper Settings (Default)

Jumper	SGPIO Jumper Setting (Default)	I^{2}C Jumper Setting	Note
JP84	Pins 1-2	Pins 2-3	Controller ID #1

C-8 Front LED Indicators

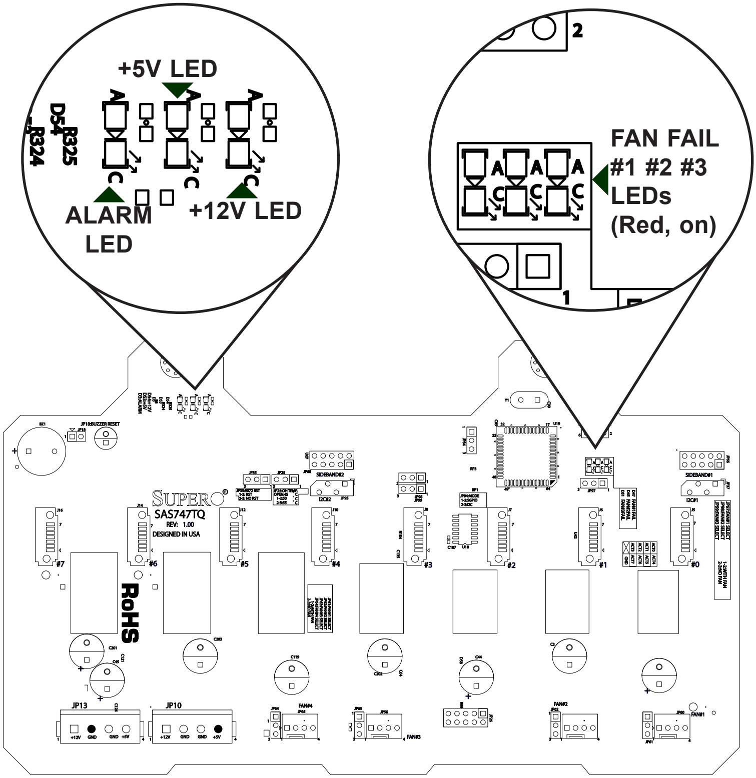

+5V LED
ALARM LED
+12V LED
D54
R325
R324
A
C
FAN FAIL #1 #2 #3 LEDs (Red, on)
2
1
SUPERO
SAS747TQ
REV: 1.00
DESIGNED IN USA
RoHS
#7
#6
#5
#4
#3
#2
#1
#0
JP13
JP10
+12V
GND
GND
+5V
FAN#1
FAN#2
FAN#3
FAN#4
SIDEBAND#1
SIDEBAND#2
I2C#1
I2C#2

Figure C-3: Front LEDs

Front LED Indicators		
LED	**Normal State**	**Specification**
Fan #1 fail	Off	Failure in Fan #1 (Red light on, steady)
Fan #2 fail	Off	Failure in Fan #2 (Red light on, steady)
Fan #3 fail	Off	Failure in Fan #3 (Red light on, steady)
Alarm #1	Off	Overheat/drive failure
+5V	On	Backplane power failure. Light is on during normal operation.
+12V	On	Backplane power failure. Light is on during normal operation.

C-9 Rear Connectors and LED Indicators

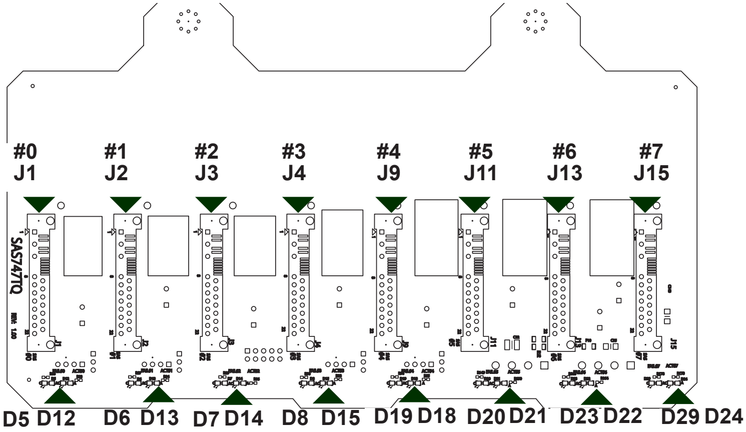

#0
J1
#1
J2
#2
J3
#3
J4
#4
J9
#5
J11
#6
J13
#7
J15
SAS747TQ
D5 D12
D6 D13
D7 D14
D8 D15
D19 D18
D20 D21
D23 D22
D29 D24

Figure C-4: Rear Connectors

Rear SAS/SATA Connectors	
Rear Connector	**SAS Drive Number**
#0	SAS/SATA HDD #0
#1	SAS/SATA HDD #1
#2	SAS/SATA HDD #2
#3	SAS/SATA HDD #3
#4	SAS/SATA HDD #4
#5	SAS/SATA HDD #5
#6	SAS/SATA HDD #6
#7	SAS/SATA HDD #7

Rear LED Indicators		
Rear LED	**Hard Drive Activity**	**Failure LED**
#0	D12	D5
#1	D13	D6
#2	D14	D7
#3	D15	D8
#4	D18	D19
#5	D21	D20
#6	D22	D23
#7	D24	D29

Notes

Disclaimer (cont.)

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